

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PCT RECEIVING OFFICE

Applicant : Shamrock Technologies, Inc.  
International Application No. : PCT/US03/31263  
International Filing Date : 01 October 2003  
Title of Invention : METHOD FOR INCORPORATING  
POLYTETRAFLUOROETHYLENE (PTFE)  
INTO SYNTHETIC SOLUTION SPUN  
FIBERS TO PRODUCE FIBERS AND  
TEXTILES HAVING IMPROVED  
PROPERTIES

**AMENDMENT UNDER ARTICLE 34  
AND REPLY TO PCT WRITTEN OPINION**

Attn: Leo B. Tentoni, Authorized Officer  
RO/US

I hereby certify that this paper for PCT/US03/31263 is being  
facsimile transmitted to 703-305-3203 at the United States Patent &  
Trademark Office on the date indicated below:

August 16, 2004

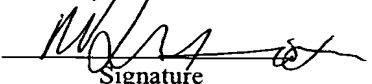
Date of Deposit

Manu J. Tejwani

Attorney Name

37,952

PTO Reg. No.

  
Signature

August 15, 2004

Date of Signature

Mail Stop PCT, Attn: IPEA/US  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In accordance with the PCT Rules, applicant hereby submits this reply to the  
Written Opinion mailed on Jun 15, 2004 in the above-referenced international application.  
Claim amendments are presented in Claims section beginning on page 2 of this paper.  
Remarks/Arguments are presented in the Remarks section beginning at page 4 of this paper.

**CLAIMS:**10/541000  
JC17 Rec'd PCT/PTO 28 JUN 2005

Pursuant to PCT Article 34, submitted herein are replacement pages 16-18 of the above-identified PCT application, which correspond to claims 1-18 identified below. In particular, claims 1 and 14 have been amended to clarify the invention. Claims 2-13, and 15-18 remain unchanged in this application

1. (Currently amended) A method for enhancing the properties of a synthetic fiber made from a viscose of soluble fiber-forming material ~~making a fiber~~, comprising:

preparing a the viscose of soluble fiber-forming material;

adding polytetrafluoroethylene (PTFE) material to the soluble fiber-forming material during the preparation of the viscose;

forcing the viscose having the added PTFE material through a spinneret into a wet bath to form the fiber composed mostly of the soluble-fiber forming material.

2. (Original) The method of claim 1, wherein adding the PTFE material to the fiber-forming material comprises dispersing PTFE particles having a size less than about one micron into the viscose.
3. (Original) The method of claim 1, wherein adding the PTFE material to the fiber-forming material comprises adding PTFE powder that is dispersible to submicron particle size.
4. (Original) The method of claim 1, wherein adding the PTFE material to the fiber-forming material comprises adding an aqueous dispersion of PTFE powder that is dispersible to low micron particle size.
5. (Original) The method of claim 4 wherein the aqueous solvent dispersion of PTFE powder comprises about 20% to about 60% PTFE by weight.
6. (Original) The method of claim 1, wherein adding the PTFE material to the fiber-forming material comprises adding an organic solvent dispersion of PTFE powder that is dispersible to low micron particle size.
7. (Original) The method of claim 1, wherein adding the PTFE material to the fiber-forming material comprises dispersing PTFE particles that have a size smaller than a channel size of the spinneret.

8. (Original) The method of claim 1, wherein adding the PTFE material to the fiber-forming material comprises introducing dispersible PTFE powder in the form of a pelletized master batch.
9. (Original) The method of claim 8, wherein the master batch comprises about 5% PTFE to about 60% PTFE.
10. (Original) The method of claim 1, wherein the fiber-forming material comprises material selected from the group of cellulose, compounds of cellulose and any combination thereof.
11. (Original) The method of claim 1, wherein preparing a viscose of fiber-forming material; comprise the steps of steeping, pressing, shredding, aging, xanatahation, dissolving, ripening, filtering, and degassing, and wherein adding polytetrafluoroethylene (PTFE) material to the fiber-forming material during the preparation of the viscose comprises adding PTFE during at least one of the steps in preparing the viscose.
12. (Original) The method of claim 1, wherein forcing the viscose having the added PTFE material through a spinneret into a solution to form the fiber, further comprises solidifying the forced viscose such that the PTFE particles are dispersed substantially through out the body of the fiber.
13. (Original) A fabric comprising fibers made by the method of claim 1.
14. (Currently amended) A synthetic fiber made from a viscose of soluble cellulose material, comprising:
  - mostly of a wet spun extrusion of cellulose material; and
  - a dispersion of PTFE particles in the wet spun extrusion of cellulose material.
15. (Original) The synthetic fiber of claim 14 wherein the PTFE particles are distributed substantially homogeneously through the wet spun extrusion.
16. (Original) The synthetic fiber of claim 14 wherein the dispersion of PTFE particles comprises PTFE particles having a size less than about one micron.
17. (Original) A fabric comprising the synthetic fiber of claim 14.
18. (Original) An article of manufacture comprising the synthetic fiber of claim 14.

**REMARKS****I. INTRODUCTION**

Applicant gratefully acknowledges the International Examiner's Reasoned Statement in the PCT Written Opinion under rule 66.2 (a)(ii) that all of the previously pending claims 1-18 have industrial applicability. The International Examiner states, however, that claims 1-18 lack novelty under PCT Article 33(2) as being anticipated Blankenbeckler et al. U.S. Patent No. 5,762,846 ("Blankenbeckler").

Independent claims 1 and 14 have been amended to clarify and bring out the nature of the invention. For the reasons set forth below and due to the clarifying nature of the amendments to these claims, applicant respectfully submits that these claims are neither anticipated nor obvious from Blankenbeckler.

Accordingly, applicant requests that the International Examiner withdraw the assertions concerning the lack of novelty and the lack of inventive step in these claims, and issue a confirmation that all of the now-pending claims 1-18 fully comply with both PCT Articles 33(2) and 33(3).

**II. CLAIMS 1-18 ARE NOT SHOWN, TAUGHT OR SUGGESTED BY BLANKENBECKLER.**

Applicants' invention concerns a method for making solution spun fibers having decreased coefficient of friction and other improved properties such as wear resistance and the like, when compared to conventional solution spun fibers. In the method of the present invention, polytetrafluorethylene (PTFE) is incorporated into the fiber-forming substance during the solution spinning process before passing through the spinneret. PTFE that is useful in the present invention includes PTFE powder that is dispersible to low micron or sub micron particle size and aqueous or organic dispersions of such highly dispersible PTFE powder. For the fiber (e.g., rayon) to retain its conventional solution spun fiber characteristics it is important that the fiber be composed mostly of the conventional fiber-

material and that the PTFE particles be evenly dispersed through the fiber and not agglomerate or accumulate (e.g., on the fiber surface).

For this purpose, PTFE which is enclosed (e.g., suspended) in a "physical" entrapment phase, which permits the PTFE particles to be dispersed in the target medium. One specific type of PTFE that may be used in the method of the present invention is described in co-assigned International Patent Application No. PCT/US03/07978 filed on March 14, 2003, which is incorporated by reference in its entirety in the instant application. The dispersed PTFE particles are released from the entrapment phase and exhibit their native or initial chemical properties once they are dispersed in the target medium.

Applicants respectfully submit that Blankenbeckler does not show, teach or suggest enhancing the properties of a synthetic fiber made from a viscose of soluble fiber-forming material by incorporating a small amount of small size PTFE particles dispersed evenly through the fiber material.

Blankenbeckler, instead, teaches coalescing PTFE material into fibers. (See e.g., col. 2 lines 48-60, and col. 3 lines 53-60). Blankenbeckler describes the use of a cohesive binder or matrix material to hold the PTFE material together in an intermediate fiber, which is then sintered to make the PTFE material fiber. Blankenbeckler teaches using very specific cellulose ether as the binder material to hold the PTFE particles together ("cellulose ether having a degree of substitution that is no more than about 0.5 and no less than about 0.02"). (See e.g., col. 2 lines 28-32, and col. 3 lines 53-60). Blankenbeckler's intermediate fibers are mostly PTFE (~ 90%). (See e.g., "PTFE: Matrix Ratio 9:1" Table 1, cols. 7-10, "ratio of the weight of the [PTFE] polymer particles to that of the matrix polymer [cellulose ether] in the intermediate fiber structure is from about 3 to 1 to about 20 to 1" col. 6 lines 17-23, and "cellulosic ether present as only a minor constituent of the fiber solids," col.3 lines 65-68 ). The 10 % of so cellulose ether binder material in the intermediate fiber is

dried and sintered to "oxidize the matrix polymer and to coalesce the fluorinated olefinic polymer particles," whereby the PTFE fiber is formed. (See e.g., col. 6 lines 54-58).

Further, Blankenbeckler does not teach making articles or fabrics from conventional solution spun material (e.g., rayon), let alone enhancing the properties of such articles/fabrics by incorporating a light dispersal of PTFE particles in them. Blankenbeckler is concerned only with the making of PTFE articles "such as such as films, tapes, ribbons and fibers of various shapes." (See e.g., col. 2 lines 9-14).

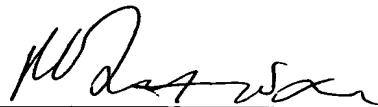
Thus, Blankenbeckler does not show, teach or suggest at least the elements of claims 1 and 14 that require the produced fiber/article to be composed mostly of the wet spun soluble-fiber forming material.

Therefore, applicant respectfully submits that both claims 1 and 14 comply with the novelty and inventive step requirements of PCT Articles 33(2) and 33(3), respectively. Further, their dependent claims 1-13 and 15-18 also for at least the same reasons comply with the novelty and inventive step requirements of PCT Articles 33(2) and 33(3), respectively.

### III. SUMMARY

For at least the reasons indicated above, claims 1-18 are in compliance with PCT Articles 33 (3) and (4) as having both novelty and inventive steps over the cited reference. A confirmation of such compliance is respectfully requested.

Respectfully submitted,



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Dated: August 16, 2004

**CLAIMS:**

1. A method for enhancing the properties of a synthetic fiber made from a viscose of soluble fiber-forming material, comprising:

preparing the viscose of soluble fiber-forming material;

adding polytetrafluoroethylene (PTFE) material to the soluble fiber-forming material during the preparation of the viscose;

forcing the viscose having the added PTFE material through a spinneret into a wet bath to form the fiber composed mostly of the soluble-fiber forming material.

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2. The method of claim 1, wherein adding the PTFE material to the fiber-forming material comprises dispersing PTFE particles having a size less than about one micron into the viscose.

3. The method of claim 1, wherein adding the PTFE material to the fiber-forming material comprises adding PTFE powder that is dispersible to submicron particle size.

4. The method of claim 1, wherein adding the PTFE material to the fiber-forming material comprises adding an aqueous dispersion of PTFE powder that is dispersible to low micron particle size.

5. The method of claim 4 wherein the aqueous solvent dispersion of PTFE powder comprises about 20% to about 60% PTFE by weight.

6. The method of claim 1, wherein adding the PTFE material to the fiber-forming material comprises adding an organic solvent dispersion of PTFE powder that is dispersible to low micron particle size.

14. A synthetic fiber made from a viscose of soluble cellulose material,  
comprising:

mostly of a wet spun extrusion of cellulose material; and

a dispersion of PTFE particles in the wet spun extrusion of cellulose material.

15. The synthetic fiber of claim 14 wherein the PTFE particles are distributed  
substantially homogeneously through the wet spun extrusion.

16. The synthetic fiber of claim 14 wherein the dispersion of PTFE particles  
~~comprises PTFE particles having a size less than about one micron.~~

17. A fabric comprising the synthetic fiber of claim 14.

18. An article of manufacture comprising the synthetic fiber of claim 14.



7. The method of claim 1, wherein adding the PTFE material to the fiber-forming material comprises dispersing PTFE particles that have a size smaller than a channel size of the spinneret.
  8. The method of claim 1, wherein adding the PTFE material to the fiber-forming material comprises introducing dispersible PTFE powder in the form of a pelletized master batch.
  9. The method of claim 8, wherein the master batch comprises about 5% PTFE to about 60% PTFE.
- 
10. The method of claim 1, wherein the fiber-forming material comprises material selected from the group of cellulose, compounds of cellulose and any combination thereof.
  11. The method of claim 1, wherein preparing a viscose of fiber-forming material; comprise the steps of steeping, pressing, shredding, aging, xanatahation, dissolving, ripening, filtering, and degassing, and wherein adding polytetrafluoroethylene (PTFE) material to the fiber-forming material during the preparation of the viscose comprises adding PTFE during at least one of the steps in preparing the viscose.
  12. The method of claim 1, wherein forcing the viscose having the added PTFE material through a spinneret into a solution to form the fiber, further comprises solidifying the forced viscose such that the PTFE particles are dispersed substantially through out the body of the fiber.
  13. A fabric comprising fibers made by the method of claim 1.

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:  
JAMES J. MAUNE  
BAKER BOTTS LLP  
30 ROCKEFELLER PLAZA  
NEW YORK, NY 10112-4498

**PCT**

Foreign Patent

JUN 21 2004

WRITTEN OPINION

(PCT Rule 66)

*MJT*

Date of Mailing  
(day/month/year)

15 JUN 2004

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BAKER BOTTS, L.L.P.

REPLY DUE

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the above date of mailing

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Applicant's or agent's file reference

35458-PCT

International application No.

International filing date (day/month/year)

Priority date (day/month/year) TO

PCT/US03/31263

01 October 2003 (01.10.2003)

01 October 2002 (01.10.2002)

International Patent Classification (IPC) or both national classification and IPC

IPC(7): D01F 2/02, 2/10, 6/12 and US Cl.: 264/187, 188, 191, 211; 106/162.6, 166.6, 170.55, 195.1, 201.1

Applicant

SHAMROCK TECHNOLOGIES, INC.

1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2 (a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

3. The applicant is hereby **invited to reply** to this opinion.

**When?** See the time limit indicated above. ~~The applicant may, before the expiration of that time limit, request this Authority to grant an extension. See rule 66.2(d).~~

**How?** By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

**Also** For an additional opportunity to submit amendments, see Rule 66.4.  
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.  
For an informal communication with the examiner, see Rule 66.6

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 01 February 2005 (01.02.2005)

Name and mailing address of the IPEA/US

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Alexandria, Virginia 22313-1450

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Authorized officer

Leo B. Tentoni

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Jean Proctor  
Paralegal Specialist

Form PCT/IPEA/408 (cover sheet)(July 1998)

WRITTEN OPINION

International application No.

PCT/US03/31263

I. Basis of the opinion

1. With regard to the elements of the international application:\*

- ☒ the international application as originally filed
- ☒ the description:  
 pages 1-15, as originally filed  
 pages NONE, filed with the demand  
 pages NONE, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
 pages 16-18, as originally filed  
 pages NONE, as amended (together with any statement) under Article 19  
 pages NONE, filed with the demand  
 pages NONE, filed with the letter of \_\_\_\_\_
- ☒ the drawings:  
 pages NONE, as originally filed  
 pages NONE, filed with the demand  
 pages NONE, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
 pages NONE, as originally filed  
 pages NONE, filed with the demand  
 pages NONE, filed with the letter of \_\_\_\_\_

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages NONE
- ☐ the claims, Nos. NONE
- ☐ the drawings, sheets/fig NONE

5. ☐ This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed."

# WRITTEN OPINION

International application No.  
PCT/US03/31263

## V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. STATEMENT

Novelty (N)

Claims NONE YES

Claims 1-18 NO

Inventive Step (IS)

Claims NONE YES

Claims 1-18 NO

Industrial Applicability (IA)

Claims 1-18 YES

Claims NONE NO

### 2. CITATIONS AND EXPLANATIONS

Claims 1-18 lack novelty under PCT Article 33(2) as being anticipated by Blankenbeckler et al (U.S. Patent 5,762,846). Blankenbeckler et al (see the entire document, in particular, column 1, lines 5-10 and 20-25; column 2, lines 23-41; column 7, lines 21-33; column 9, lines 49-67) teach a process of making a fiber including the steps of preparing a viscose of soluble fiber-forming material, adding PTFE to the material and forcing the material through a spinneret into a wet bath to make a fiber. Blankenbeckler et al also teach such a fiber, as well as articles of manufacture (e.g., fabric) comprising such fibers.

Claims 1-18 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

----- NEW CITATIONS -----